

ABSTRACT OF THE DISCLOSURE

This invention relates to a new method of digital FM demodulator that uses a crystal as timing reference and the concept of delta-sigma modulator and analog-to-digital converter to implement the function of time-to-digital converter. The demodulator comprising delay lines, multiplexer, phase comparator, sample and hold circuit, quantizer and digital integrator. The modulation signal in the frequency segment will pass through delay lines around the crystal and compare with original input modulation signal, and the difference is converted into voltage and store in capacitor by way of charge transfer. When the quantized voltage has been accumulated, then re-select a different delay line signal to compare its phase with input signal. This system is a closed-loop feedback system. This quantized digital signal again pass through a digital filter to filter out high frequency quantized noise to get the demodulation signal. This system combines the function of demodulation and analog-to-digital conversion.

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